

INNOVATION CAPACITY – PROBLEMS AND SOLUTIONS FOR SUCCESSFUL DEVELOPMENT

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Abstract. Innovation capacity has to be viewed as a consequence of properly operating innovation system. Well established and functioning innovation system is a result of enhanced by government innovation policy. In comparison with other European Union (EU 27) countries, innovation capacity indicators in Latvia remain low and considerably underperform, reflected in the ‘European Innovation Scoreboard 2008’, where Latvia took the 30th place among 32 countries. Problems and solutions are illustrated to represent innovation capacity in Latvia.

This article consists of the following parts: first - theoretical aspects are selected to describe the essential definition of the analyzed subject. In the second part, experience from abroad is described, at the end – Latvian innovation policy and situation is analyzed and suggestions for further needs are formulated.

The main results of analysis show that only a few elements of innovation capacity building are functioning at Latvian enterprises, whose aim is to build a base for the innovation capacity of the country.

Key words: innovation capacity, innovation system, innovation policy.

Introduction

The article focuses on innovation capacity issues and illustrates innovation systems in Latvia and abroad. One of the components of the system – entrepreneurship is also researched. Innovation capacity is defined by several authors, but it can have a different meaning if applied to national or organizational level. Meanwhile, it doesn't change the importance of the term, being one of driving elements of national economy development. Country's development is dependent on properly functioning national innovation system. Countries with highly ranked innovation capacity like Sweden and Finland have leading innovation institution, which leads and actively develop innovation capacity.

Latvian national innovation system still needs a lot of improvement, with the main idea to improve cooperation among National innovation system elements, boost knowledge of those elements and have more coordinated actions from governance institution.

According to the statement of Ministry of Economics representative A. Burka from the department of Industry and Innovation, based on the meeting held on 1st of July, 2010, national innovation capacity indicators in 2010 do not have positive impact and Latvia still stays in catch up countries group. It is also admitted that Latvia lack locally executed researches, which would clearly state reasons and obstacles for innovation capacity problems. The same is also reflected in the ‘Global Competitiveness Report 2009 – 2010’, published by World Economic Forum, among 134 countries, Latvia ranked in 68th place.

As innovation capacity depends on external and internal determinants, it has to be defined which have key priorities to be stimulated.

Materials and Methods

The main hypothesis of the article is to identify regularity between innovation capacity innovation system and one of its elements - entrepreneurship;

functioning level of activity and direct mutual influence.

The aim of the article is to analyze innovation capacity of Latvia and illustrate linkage between national innovation system and policy, identify main issues and propose solutions for improvement. The innovation capacity can be directly measured by EIS (European Innovation Scoreboard yearly research), in context of this research EIS has used a base quantitative indicator, to illustrate Latvia's position in comparison to EU 27.

From the qualitative perspective national innovation system structure can be measured in comparison to international systems and correlation of EIS innovation capacity data can be accordingly correlated.

Scientific problem – unsolved innovation capacity issues can be found in different materials and researches stated by Latvian institution documents, European Commission or international documents, for example, by the European Commission, Innovation Policy Progress Report, 2009. The scientific problem consists of practical challenges to develop innovation system for boosting innovation capacity of the country, by creating adequate innovation policy.

Main tasks of the article – 1) make review of international experience in innovation capacity development; 2) analyse the current national innovation system in Latvia; 3) review one of the main national innovation system elements – entrepreneurship – and its current situation from innovation capacity perspective. Main data sources used for analyses and comparisons: researches, statistics, programs and policies for development of entrepreneurship and innovation in Latvia and abroad.

2 discussions with acting in innovation system participants - Latvian Investment and Development Agency representatives Mr. M. Elerts and Mr. V. Zeps (24 of February, 2010) and Latvian Technological Center director Mr. J. Stabulnieks (2 of March, 2010) were carried out.

Author’s practical interpretation of specific innovation capacity determinants were provided. Solutions and conclusions were represented to summarize article findings of innovation capacity provided.

An article provides analysis and comparison for the time period 2006 – 2009.

Results and Discussion

Innovation capacity and innovation system definition.

Innovation capacity has been mentioned by several authors K. Pavitt (1982), M.E. Porter (1990) and L. Suarez –Villa (1990), all of them claim rights of a term invention. L. Suarez -Villa defined similar concept of innovation capacity, but named it innovative capacity, measuring the level of invention and the potential for innovation in any nation, geographical area or economic activity. Measuring innovative capacity over time can provide important insights on the dynamics of any economic activity, nation or geographical area. Declining level of innovative capacity for any industry or activity can serve as an early warning of future difficulties and decline. Porter has defined innovative capacity as a potential of economy, which is protractedly used to create a flow of commercial innovations. Innovation capacity is not only dependent from the level of technology and quality of human resource, but also from priorities settled by government.

While assessing innovation capacity, internal and external determinants – micro and macro environment (Bell, 1984) – many factors, inside and outside the company can impact innovation capacity and are important. See detailed explanation of determinants, figure 1 ‘Internal and external determinants of innovation capacity’, the author’s developed classification.

Innovation capacity can be defined at 2 levels: macro or a national level and micro or a company level. National innovation capacity can be only viewed as a result of properly functioning innovation system.

The national innovation system approach has been introduced in the late 1980s by C. Freeman (1987), Dosi et al. (1988) and further elaborated in the following years (Lundvall, 1992; Nelson, 1993; Edquist, 1997). A national innovation system can be perceived as a historically grown subsystem of the national economy in which various organizations and institutions interact and influence each other in the carrying out of innovative activity.

Nowadays, definition and concept hasn’t changed a lot, the World Bank (2007) defines innovation system as a network of organizations focused on bringing new processes and new forms of organizations into social and economical use. National innovation system is formed by innovation policy at country or regional level. National innovation system consists of 4 elements: 1) research and development; 2) entrepreneurship; 3) finance system; 4) legislation.

Both groups of determinants are important for successful development of innovative capacity of enterprise, but some of them have to be more admitted.

Absorptive capacity is linked to innovative capacity in a way that absorbed knowledge can or can’t be transformed into successful innovation.

Knowledge and competence are determinants, which on the level of small and medium enterprises - SMEs always raise problems to be delivered. At least two major channels are identified how those can be obtained. W. Cohen and D. Levinthal (1990) suggest that some firms develop the capacity to adapt new technology and ideas and are therefore able to appropriate some of the returns accruing to investments in new knowledge made externally. In contrast, D. Audretsch (1995) proposes shifting the unit of observation to the unit of the individual – the scientists, engineers, and other knowledge workers – as agents endowed with new economic knowledge.

Innovation system and governance role.

In examining role of government in national innovation system, 3 indicators are crucial: leadership,

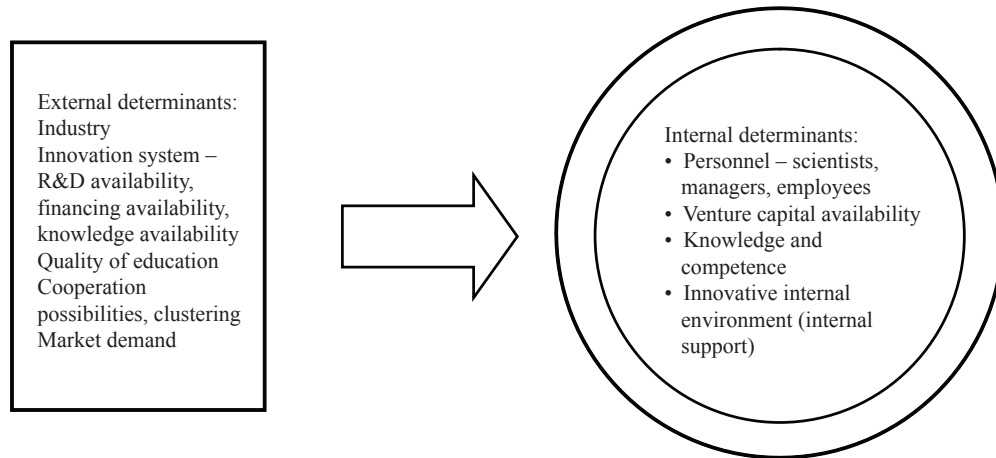


Figure 1. Internal and external determinants of innovation capacity.

Source: the author’s classification.

execution and review: 1) leadership – the main idea is to lead and develop national priorities and articulation of desirable outcomes; 2) execution – formulation of rules and programs to deliver outcomes; 3) review – ongoing process of monitoring outcomes.

Organization for Economic Cooperation and Development - OECD (2005) points to range of barriers coherence in national innovation systems, including freezing policies, complexity and fragmentation. A common problem for many governments is that they use yesterday's institutions to meet tomorrow's problems. To achieve the coherence, flexibility and common sense of innovation system, innovation policy has to be developed by leading, central institution, responsible for innovation. Institution has the following matters to deal with:

- ability to determine national innovation system priorities;
- to have clear helicopter-view over overall innovation environment in country;
- initiate supportive actions (programs, legislation, elements, support instruments) for innovation system development;
- coordinate and guideline implementation of supportive actions;
- audit results and continue follow up innovation system improvement process.

Innovation systems in countries with high innovative capacity like Finland and Sweden, the national innovation system is a lead in following way: 1) Finland: the Finnish national innovation system has always had a strong focus on regional development through technology transfer, and there is a diverse range of capital providers for innovation, both private and public. SITRA – The Finnish Innovation Fund is one of them and provides capital for start-up technology firms, always as a minority investor, as well as services to match SMEs. Ministry of Employment and the Economy is responsible for the national innovation policy.

As an example, Finnish national innovation system development process in the year 2009 is described. The practical preparation of the strategic work was carried out by the Ministry of Employment and Economy. The strategy was prepared involving the extensive consultation of specialists, stakeholders and citizens. Eleven workshops, focusing on the key challenges of innovation policy, were held in the autumn of 2007. Nearly 800 specialists gave their views in the workshops and online. A steering group, chaired by Esko Aho, President of SITRA was appointed for the actual preparation of the innovation strategy. In Sweden there are two ministries, namely, the Ministry of Industry, Communication and Employment and the Ministry of Education and Culture that share the main responsibility for innovation policy. Although the concept of innovation policy has been developed since the end of the 1990's, it wasn't clearly defined until 2001, when the new institutional structure (organization of research system) was introduced. In order to focus

on coordination between economic growth policy and research policy, the Swedish Agency of Innovation Systems (VINNOVA) was established. VINNOVA has a mission of promoting sustainable economic growth by financing research and technology development (R&D) and developing innovation systems. In 2004, the Swedish Government (Ministry of Industry and Ministry of Education) introduced its main innovation policy document "Innovative Sweden". The formulation and implementation of technology and innovation policies are passed by the government to its agencies. The agencies create a number of programs and fund them mainly using co-funding from other sources (both state and private). The main agencies in this area are VINNOVA, The Swedish Agency for Business Development (NUTEK), the Space Agency (Rymdstyrelsen), the Energy Agency (STEM).

Showing importance of innovation in Australia, innovation is included as a part of ministry and Minister for Innovation, Industry, Science and Research is dedicated to develop innovation system. The same approach is in Canada where the Ministry of Research and Innovation coordinates the national innovation system.

It wouldn't be fair from the economy development point of view to compare Latvia, for instance, with Sweden or Finland, but it is adequate to compare it to Estonia, where the development of innovation capacity and environment has very similar starting point. The closest neighborhood country - Estonia has made a step towards a change in innovation capacity development. Enterprise Estonia and special tool called Estonian Development Fund, established in 2007 by the Riigikogu (Estonian Parliament) with the purpose of initiating and supporting changes in the Estonian economy and society, perform functions of the innovation capacity development and support in the country level. Development Fund performs risk capital investments into the starting and growth-oriented technology companies together with the private sector and carries out socio-economic and technology foresight. The goal of the Development Fund's investment activities is to develop Estonia's venture capital market. In order to serve that purpose, the Development Fund makes venture capital available to start-up growth companies, encourages business angels to invest into start-up companies and popularizes venture capital among entrepreneur. Estonia has a clear vision and action plan how to make positive change in innovative capacity building through funding, support and a clear action plan for SMEs.

Innovation policy in Latvia.

The main body coordinating Innovation policy development is the Ministry of Economics with further submission of policy documents to the Cabinet of Ministers. The main document currently, in 2010, coordinating the national innovation system development and implementation is 'Entrepreneurship Competitiveness and Innovation Promotion Program for 2007-2013'.

Innovation policy in Latvia, at a current stage, covers only particular areas with an unclear vision of the weakest elements in the system to be supported. The leading body of the innovation policy development and coordination is the Ministry of Economics, represented by a structure called ‘Industry and innovation division’, consisting of 6 people, according to officially available information on the Ministry of Economics home page. The number of personnel employed is insufficient, and it is a clear weakness in terms of innovation policy formation. Dealing with administrative functions and documentation, and legislation adaptation in accordance with the EU standards and requirements is a consuming function, which does not provide much time for strategic innovation policy planning.

According to Innovation Policy Progress report (2009), ‘External assessments point to the fragmented nature of a policy formulation and there is room for improved inter-ministerial coordination in Latvia as well as the need for a closer integration of R&D and innovation policy. While in numerical terms the number of organizations involved in the innovation governance system of Latvia seems sufficient, there is a continuous lack of a high level coordinating body in this domain’.

Until the mid year of 2009, similar to Europe or closer neighbourhood practice - Estonia, Latvia has executed innovation system enchantment under Latvian Investment and Development Agency (LIDA), by the department concentrated on innovation, called - ZINIS. It was established in 2006 with the main aim to improve policy of innovation system, coordinate national innovation system action plan execution and promote cooperation between government institutions, industry and research and development sector. Even it has to be admitted that for a successful innovation system development there has to be done more, liquidation of this department, due to budget costs, from the national perspective is arguable. Its main functions were delegated to the Ministry of Economics.

Capacity of a small division to make radical decisions and lead the national innovation policy in a way to provide sustainable and successfully development of innovation system is questionable.

Entrepreneurship in Latvia.

In the country, where 99.4% of enterprises are classified as SME, the analysis of the innovation capacity has to be viewed in correlation to dominant form of entrepreneurship. In 2007, the total number of entrepreneurs was 69 863 thousands, where micro enterprises constitute 78.6%, small enterprises – 17.3% but medium - 3.5% - according to the Central Statistics Bureau of Latvia. The total number of enterprises, self employment, peasant and fishermen farms were not accounted. Besides SME form, economy is largely driven by self-employment, which counts for 62% of total economically active statistic units, see Figure 2 ‘Economically active statistic units in Latvia, 2006 – 2008’.

As micro enterprises are leading forms of the country economy, the development of innovation capacity has to be concentrated on proper support of micro enterprises, besides that also self-employment has to be stimulated as in a long run it can gradually become SME entrepreneurship.

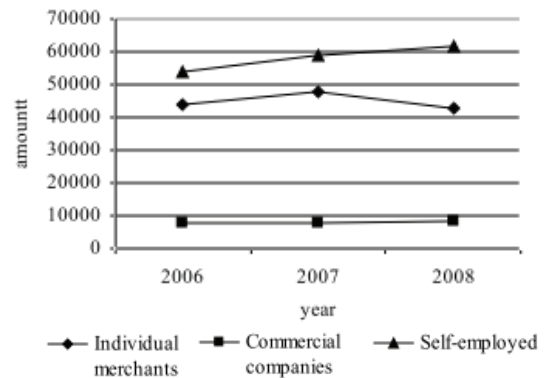


Figure 2. Economically active statistic units in Latvia, 2006 – 2008.

Source: Central Statistical Bureau of Latvia
Comments: Provisional data, 2008

In the context of innovation capacity, analysis of statistical data was important due to the reason that small business tend to have very limited financial resources not sufficient for investments in innovation as well as limited knowledge base, even about basic processes for innovation. The most of SME are able to develop new processes, products or services accessing external source (Tyson, 1993). External knowledge has to be adopted with SME internal activities. SME is not always able to find sources of knowledge, even if it is done, they might find difficult to adopt newly gained knowledge in an organization. The ability of SME adopt knowledge is called absorptive capacity (Zahra and Georg, 2000).

Based on extracted statistical data facts where SMEs are dominant, the innovation capacity strongly depends on government support and provision tools, instruments and programs to support 2 crucial conditions: finance availability (external) and knowledge base (internal) determinant. In Latvia, both at the moment are at a low level among entrepreneurs, even if financing somehow can be fixed (through bank support - Hipoteku banka, Imprimatur Capital, Baltcap), knowledge base may take years to develop the level, needed to create valuable innovation.

An entrepreneur in Latvia has to possess much more than just a definition of innovation. There has to be a complex of knowledge acquired like commercialization, prototyping, market research, export, cooperation, negotiations and more. An idea can remain an idea and never get commercialized if not properly handled.

Research conducted among 306 (122 from districts and 184 from Riga and suburb) enterprises ‘Analysis

of innovation need of small and medium enterprises in Latvia, 2007' done by Latvian Technological Center indicates that less than 20 have used Riga Technical University services, even less used University of Latvia (LU) and Latvia University of Agriculture (LLU) services, and only few named Rezekne Higher Education Institution. The number of enterprises, who used services and assured cooperation between research and industry, is critically low. General trend is very clear – there is still no cooperation between enterprises and universities. More than 200 respondents, as the main obstacle in cooperation, name lack of information about services provided by universities. As traditionally universities are perceived as educational institutions, research and development, is not associated as a service to be provided. This hypothesis has to be confirmed in a specific study regarding entrepreneurs and their perception of innovation, research and development. As the second obstacle, with less than 200 replies, 'passive' attitude from research institutions is mentioned.

Moreover, according to the same analysis, the situation in Latvia shows that entrepreneurs are not willing to cooperate with research and development personnel from universities due to the opinion that knowledge they own is theoretical and do not suit current market situation. The same document states also that 'there is a lack of highly qualified and motivated personnel, which decrease innovation capacity of entrepreneurs. This point also reflects the fact that SME are rather micro-companies or self-employed, and there is not a chance for massive knowledge of innovation including product development and commercialization process. Answering the question about presence of the innovation process in organizations, 126 enterprises (41.2%) have made positive statements, but 180 enterprises agreed that there is no innovation process, or didn't give any reply. The research conductors assure that the number of enterprises with innovation processes in line is even smaller. Based on replies from respondents, it was clear that respondents do not understand what innovation and innovation process are.

Based on statements made by the research executers, there is a weak, or no understanding regarding innovation management in the largest part of Latvian enterprises. These statements can be also confirmed by all other related data from the same research, (cooperation with universities, number of patents etc.,) which directly shows enterprises' ability to assure innovation management. Even if some of elements might be managed properly, there is no system that would guarantee professional innovation management within the enterprise.

Following steps of research and inspecting the drivers for innovation (combining internal and external), 115 enterprises (91.3%) from total that have innovation process as driving force mentioned their own, internal sources; 68 of enterprises have started innovation process as an initiative from a customer or consumer; 51 – based on owners initiative and 12

– based on initiative from international enterprise. It should be mentioned that universities and R&D institutions have initiated innovation process in just three enterprises. Based on this data, the assumption can be made that networking, especially, international networking, is a weak area in Latvian enterprise. The lack of networking leads to a lack of knowledge acquisition and to a low level of innovation.

The results of innovation measured as percentage of turnover, has made no effect in 25 enterprises, 25 enterprises see that a new product or service generates around 1-5% from the total turnover; 26 – answered that amount is 5-25% and only 9% that more than 50%. Assuming that innovation can be incremental or radical, depending on the age of the company and nature of business, it is acceptable that there may be different levels of generated results, including unsuccessfully introduced innovation, but the average number of enterprises with ranges 5-25% new profit generation, has to be higher by at least half.

176 enterprises (57.5% from all surveyed) have mentioned new market acquisition as the main condition for the development. 163 enterprises (53.3%) have experienced growth as a result of new product developments and 158 (51.6%) as optimization of the company and its costs balancing. Six main development factors show that enterprises' plan to find new markets in Latvia and Europe, develop new products, optimization of company operations and costs cutting.

Cooperation and networking are mentioned among the least important factors for development and are ranked as number 14 with 55 votes or (18%). Also an indicator, - willingness to improve internal competence is ranked only as the 8th. The latter two (low interest in cooperation and internal competence improvement) show that an enterprise still does not understand the importance of knowledge, which has to be generated inside the enterprise or acquired externally. Enterprises are only concentrating on final steps of successful innovation, but do not understand how to organize efficiently internally, enter new markets, or develop new and successful products.

Innovation capacity in Latvia.

Innovation capacity indicators in Latvia, remain low and considerably underperform in comparison with the European Union (EU 27) countries. The same is also reflected in 'European Innovation Scoreboard 2008', where Latvia occupied the 30th place among 32 countries. Innovation Policy Progress report (2009) also admits that the level of innovation capacity is low. Low level of innovation capacity is also stated by other institutions: 1) according to the Central Statistical Bureau of Latvia in 2008, only 19.5% of enterprises were innovative and developed or commercialized new products. Average level in Europe is around 45-50% according to Innobarometer 2009 data; 2) according to the data 'European Innovation Scoreboard 2008' high tech sector proportion in export portfolio, stands only for 23.9%, while in the EU 27 it is 48.1%; 3) the 'Global Competitiveness Report

2009 – 2010', published by World Economic Forum, among 134 countries, Latvia ranked in 68th place. While analyzing more deeply 12th pillar: 'Innovation', level of innovation capacity is low and driven by several indicators: 1) capacity of innovation – rank 68; 2) company spending on R&D – rank 95; 3) government procurement of advanced tech products – rank 102; 4) university - industry collaboration in R&D – rank 86.

After summarizing data on innovation capacity, it is clear that it is low and in correlation with not properly functioning innovation system and based on a low functioning of one of its elements - entrepreneurship. External determinants are not enough stimulating, also internal determinants problems persist, meaning absorption capacity and knowledge of SME. Proposals for improvement and conclusions are made further in the abstract.

Proposals for improvement.

National innovation system has to obtain a leading institution, not to coordinate, but actively lead and develop national innovation system by implementing accordant national innovation policy;

Positive experience of countries like Estonia, Finland and Sweden, has to be benchmarked and implemented in the development of national innovation system in Latvia; a leading specialist in the national innovation system from abroad has to be invited to contribute for policy development;

While planning innovation capacity of a country – entrepreneurship abilities have to be analyzed and support tools developed in accordance; especially knowledge share, development and building activities.

Cooperation among enterprises and universities has to be enhanced and popularized by creation financed programs to support active and productive cooperation.

Assessment and ranking of importance of internal and external determinants of innovation capacity in Latvia, has to be done at national level. Based on results, national innovation policy has to include solution instruments categorized by importance.

Investments in human resources are necessary (SME managers, owners and employees) with an aim to increase absorption capacity (training courses, foreign languages, online materials).

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Conclusions

1. This research is a present evidence of the fact, that innovation capacity is a measuring indicator of efficiency of national innovation system. Taking into account weak performance of national innovation system, which can be characterized by weak cooperation among system elements, lack of knowledge of innovation management in Latvian enterprises, lead to low level of innovation capacity.
2. Creation of adequate and properly functioning national innovation system with leading innovation institution is a must, to improve innovation capacity of the country. In comparison to closer countries, Estonia, Finland and Sweden, it is obvious that several elements of national innovation system – specific agencies or instruments have to be implemented to promote innovation capacity.
3. There are many determinants which influence innovation capacity in the company, and the role of National Innovation system is to create environment with positive impact of external determinants of innovation capacity and also lead execution. Those are currently due to lack of finance not executed in full speed and amount.
4. Latvian economy mainly consists of SMEs 99.4% where majority are micro companies. In respect to this, the leading institution of innovation system and policy development, the Ministry of Economics has to have a clear vision about targeted support of financing SMEs and knowledge enhancement. Executed actions so far are limited and do not provide massive positive impact.
5. Learning from the leading countries in innovation capacity building and policy development, would be the main objective in medium term period of 3 -5 years for Latvia to assure national innovation capacity increase.
6. Situation of innovation capacity in Latvia at the moment can be described as weak, and this conclusion is supported by various, independent sources of information listed in research. Correlations can be made between low level of innovation capacity in enterprises, reflecting low level national innovation capacity.

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